Phase II and Phase III Archeological Database and Inventory

MARYLAND HISTORICAL TRUST

Site Number: 18FR320 **Site Name:** Catoctin Foundry

Other name(s) Orr's "Check 3"

Prehistoric ☐ Historic ☑ Unknown ☐

Brief Description: late 18th century mill race, early-mid-19th century iron foundry/forge

Site Location and Environmental Data:

Latitude 39.5693 Longitude -77.4208

Elevation m Site slope 6-10%

Site setting

-Site Setting restricted

-Lat/Long accurate to within 1 sq. mile, user may need to make slight adjustments in mapping to account for sites near state/county lines or streams

Maryland Archeological Research Unit No. 17

Physiographic province Blue Ridge

Ethnobotany profile available ☐ Maritime site ☐

SCS soil & sediment code AdB2

Terrestrial site ☑ Underwater site ☐

Topography

Floodplain	☐	High terrace	☐
Hilltop/bluff	☐	Rockshelter/ cave	☐
Interior flat	☐	Hillslope	☑
Upland flat	☐	Unknown	☐
Ridgetop	☐	Other	☐
Terrace	☐		
Low terrace	☐		

Ownership

Private	☐
Federal	☐
State of MD	☐
Regional/ county/city	☐
Unknown	☑

Nearest Surface Water

Name (if any) Unnamed tributary of Little

Saltwater		Freshwater	
Ocean	☐	Stream/river	☑
Estuary/tidal river	☐	Swamp	☐
Tidewater/marsh	☐	Lake or pond	☐
		Spring	☐

Minimum distance to water is 350 m

Temporal & Ethnic Contextual Data:

Paleoindian site	☐	Woodland site	☐	Contact period site	☐	ca. 1820 - 1860	Y
Archaic site	☐	MD Adena	☐	ca. 1630 - 1675	☐	ca. 1860 - 1900	☐
Early archaic	☐	Early woodland	☐	ca. 1675 - 1720	☐	ca. 1900 - 1930	☐
MIddle archaic	☐	Mid. woodland	☐	ca. 1720 - 1780	Y	Post 1930	☐
Late archaic	☐	Late woodland	☐	ca. 1780 - 1820	Y	Unknown historic context	☐
Unknown prehistoric context	☐			Unknown context	☐		

Ethnic Associations (historic only)

Native American	☐	Asian American	☐
African American	☐	Unknown	☐
Anglo-American	☐	Other	Y
Hispanic	☐	Irish-American?;Scottish-American?	

Y=Confirmed, P=Possible

Site Function Contextual Data:

Prehistoric

Multi-component	☐	Misc. ceremonial	☐
Village	☐	Rock art	☐
Hamlet	☐	Shell midden	☐
Base camp	☐	STU/lithic scatter	☐
Rockshelter/cave	☐	Quarry/extraction	☐
Earthen mound	☐	Fish weir	☐
Cairn	☐	Production area	☐
Burial area	☐	Unknown	☐

Other context ☐

Historic

Urban/Rural? Rural

Domestic	☐	Furnace/forge	☑	**Military**	☐
Homestead	☐	Other	☑ iron foundry	Battlefield	☐
Farmstead	☐	**Transportation**	☐	Fortification	☐
Mansion	☐	Canal-related	☐	Encampment	☐
Plantation	☐	Road/railroad	☐	**Townsite**	☐
Row/townhome	☐	Wharf/landing	☐	**Religious**	☐
Cellar	☐	Maritime-related	☐	Church/mtg house	☐
Privy	☐	Bridge	☐	Ch support bldg	☐
Industrial	☑	Ford	☐	**Burial area**	☐
Mining-related	☐	**Educational**	☐	Cemetery	☐
Quarry-related	☐	**Commercial**	☐	Sepulchre	☐
Mill	☑	Trading post	☐	Isolated burial	☐
Black/metalsmith	☑	Store	☐	**Bldg or foundation**	☑
		Tavern/inn	☐	Possible Structure	☐

Post-in-ground	☐	**Slave related**	☐
Frame-built	☐	**Non-domestic agri**	☐
Masonry	☐	**Recreational**	☐
Other structure	☐	**Midden/dump**	☐
		Artifact scatter	☐
		Spring or well	☐
		Unknown	☐
		Other context	☐

Interpretive Sampling Data:

Prehistoric context samples			
Soil samples taken	☐		
Flotation samples taken	☐	Other samples taken	

Historic context samples			
Soil samples taken	U		
Flotation samples taken	U	Other samples taken	wood,slag,iron

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Diagnostic Artifact Data:

Projectile Point Types

Clovis		Koens-Crispin	
Hardaway-Dalton		Perkiomen	
Palmer		Susquehana	
Kirk (notch)		Vernon	
Kirk (stem)		Piscataway	
Le Croy		Calvert	
Morrow Mntn		Selby Bay	
Guilford		Jacks Rf (notch)	
Brewerton		Jacks Rf (pent)	
Otter Creek		Madison/Potomac	
		Levanna	

All quantities exact or estimated minimal counts

Prehistoric Sherd Types

Marcey Creek		Popes Creek		Shepard		Keyser	
Dames Qtr		Coulbourn		Townsend		Yeocomico	
Selden Island		Watson		Minguannan		Monongahela	
Accokeek		Mockley		Sullivan Cove		Susquehannock	
Wolfe Neck		Clemson Island		Shenks Ferry			
Vinette		Page		Moyaone			
				Potomac Cr			

Historic Sherd Types

Earthenware		Ironstone		Staffordshire	
Astbury		Jackfield		Tin Glazed	
Borderware		Mn Mottled		Whiteware	10
Buckley		North Devon		**Porcelain**	10
Creamware		Pearlware	10		

Stoneware

English Brown	
Eng Dry-bodie	
Nottingham	
Rhenish	
Wt Salt-glazed	

Other Artifact & Feature Types:

Prehistoric Artifacts

Flaked stone		Other fired clay	
Ground stone		Human remain(s)	☐
Stone bowls		Modified faunal	
Fire-cracked rock		Unmod faunal	
Other lithics (all)		Oyster shell	☐
Ceramics (all)		Floral material	☐
Rimsherds		Uncommon Obj.	
		Other ☐	

Prehistoric Features

Mound(s)		Storage/trash pit	☐
Midden	☐	Burial(s)	☐
Shell midden	☐	Ossuary	☐
Postholes/molds	☐	Unknown	☐
House pattern(s)	☐	Other	☐
Palisade(s)	☐		
Hearth(s)	☐		
Lithic reduc area	☐		

Lithic Material

Fer quartzite	☐	Sil sandstone	☐		
Jasper	☐	Chalcedony	☐	European flint	☐
Chert	☐	Ironstone	☐	Basalt	☐
Rhyolite	☐	Argilite	☐	Unknown	☐
Quartz	☐	Steatite	☐	Other	☐
Quartzite	☐	Sandstone	☐		

☑ **Dated features present at site**

The raceway feature can be roughly dated to 1760-1787.

Historic Artifacts

Pottery (all)	565	Tobacco related	
Glass (all)		Activity item(s)	7486
Architectural	5	Human remain(s)	☐
Furniture		Faunal material	☑
Arms	1	Misc. kitchen	
Clothing		Floral material	☐
Personal items		Misc.	21
		Other ☑	slag

Historic Features

Const feature	☐	Privy/outhouse	☐	Depression/mound	☐
Foundation	☑	Well/cistern	☐	Burial(s)	☐
Cellar hole/cellar	☐	Trash pit/dump	☐	Railroad bed	☐
Hearth/chimney	☐	Sheet midden	☐	Earthworks	☐
Postholes/molds	☐	Planting feature	☐	Mill raceway	☑
Paling ditch/fence	☐	Road/walkway	☐	Wheel pit	☐

Unknown	☐
Other	☐

All quantities exact or estimated minimal counts

Radiocarbon Data:

Sample 1:	+/-	years BP	Reliability	**Sample 2:**	+/-	years BP	Reliability	**Sample 3:**	+/-	years BP	Reliability
Sample 4:	+/-	years BP	Reliability	**Sample 5:**	+/-	years BP	Reliability	**Sample 6:**	+/-	years BP	Reliability
Sample 7:	+/-	years BP	Reliability	**Sample 8:**	+/-	years BP	Reliability	**Sample 9:**	+/-	years BP	Reliability

☐ **Additional radiocarbon results available**

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External Samples/Data:

Collection curated at MAC

☑ Additional raw data may be available online

Summary Description:

Site 18FR320 is the location of the remains of a late 18th century raceway and of early-mid 19th century ancillary iron-working facilities. The site is located in the southern portion of the Catoctin Furnace Historic District along US Route 15 in Frederick County, Maryland. Excavations at the site revealed evidence of a raceway that was part of the first hydraulic power system used in iron-working at Catoctin Furnace, and 19th century features and artifacts that suggest use of the area in ancillary iron-working activities such as the finishing and final assembly of cast-iron goods produced elsewhere, and the storage of charcoal fuel. Such activities usually took place near forges, foundries, or furnaces and a charcoal house would have normally been located near the point of consumption. This evidence seems to suggest the presence of a significant historic iron-working facility (forge, foundry, etc.) nearby, just off-site.

The site was first examined by archeologists in 1977 during a Phase I survey through the Catoctin Furnace Historic District and environs prior to the dualization of US Route 15. The area was first drawn to the attention of researchers by a local informant and long-time resident of the Catoctin Furnace area, Mr. William Renner. He generated a sketch map from his own recollections and historical research showing a dam and lake (Auburn Pond) near the intersection of US 15 and MD 806, with a wheel pit in the dam and a rectangular structure labeled “forge – 1760s”. Ethnohistorical interviews and archival research add additional details to Renner’s interpretation for this portion of the Catoctin Furnace lands. A brief overview of this research will be provided, followed by a general description of the archeological work.

Archival and oral history research reveal that in the year 1774, James, Thomas, Baker, and Roger Johnson constructed the first iron furnace at Catoctin. In 1776, they began producing pig iron under the name of James Johnson and Company. Hematite ore from the Catoctin Mountains provided the raw material for production of the iron while the Catoctin forests provided charcoal for fuel. In addition, water from the local springs and streams provided the energy to power enormous bellows blowing air into the furnace, as well as power for forge hammers, mills, and other machines. A complex system of ponds, races, ditches, dams, and aqueducts ensured that the water wheels were supplied with sufficient “drop” to maintain the power levels needed. One of the most important early products of the furnace is rumored to have been supplies (including cannonballs) for George Washington’s Army. While pig iron continued to be produced at the furnace, other important products were machine parts, foundry rolling mills, iron car/cart wheels, cast-iron stoves, and other materials. During the Civil War, iron from the furnace was used to armor the famous iron-clad ship, the Monitor. Over the course of history a number of additional furnace stacks, support structures, quarries, casting areas, and other structures were constructed in the area. Some structures were demolished and improved facilities were built.

No issue is more contentious in the interpretation of the Catoctin Furnace area than the location of the original stack built by the Johnsons. Many researchers have argued that all of the furnaces at Catoctin were located in the same general area. This is the main furnace area to the north; site number 18FR29. Archival evidence clearly indicates that a hot blast charcoal furnace (called “Isabella”) was built in 1856 near the site of an already extant charcoal furnace dating back to the 18th century. Much of Isabella was dismantled in 1893, but some ruins were left and the stack and casting house were eventually restored for interpretive purposes. The old 18th century stack near Isabella had been dismantled a few years prior (ca. 1890) after being deemed obsolete. The last furnace to be constructed at Catoctin was “Deborah”, built in 1873. This was a steam and water operated hot blast, anthracite coke furnace encompassing the latest improvements in furnace technology. Its annual capacity for producing pig iron was 3 times that of the other two furnaces combined. It was dismantled in the early 20th century following the last blast at Catoctin and salvageable parts were shipped to iron furnaces in Pennsylvania. What is less certain historically is whether the old charcoal furnace near Isabella (see above) was the original (ca. 1774) stack, a later 18th century stack constructed on the same site as the original, or a later 18th century stack constructed approximately ¾ mile north of the original (ca. 1774) furnace. The key piece of historical evidence for a furnace stack outside the confines of 18FR29, is a statement by J.H. Alexander concerning information he had received directly from James Johnson, descendent of the founders of Catoctin Furnace. In 1840 Alexander wrote that, “The original furnace was built in 1774 by James Johnson & Co. within a mile of the present furnace stack, and carried on successfully until 1787, in which year the same company erected the present furnace about three-fourths of a mile further up the Little Hunting Creek and nearer the ore banks”. Since Alexander’s informant was a Johnson, he is probably correct and the 18th century stack standing in 1840 at 18FR29 was the second Johnson stack constructed in 1787. It should also be noted, that Site 18FR320 is situated nearly ¾ mile south of Isabella and is situated at the southern reaches of the earliest as yet discovered hydraulic System at Catoctin (Raceway System A). The possibility that the first Catoctin stack was located on or near 18FR320 was certainly at the forefront of investigators’ minds as they worked at the site.

Oral history does suggest that some sort of iron-working facility, typically referred to as a forge, was located south east of the Auburn Pond. One local informant, an 80 year-old man recalled his mother saying she used to play in the “Old Forge” house which was standing in the area without its roof when she was a child. Another man in his 70s used to boat on Auburn Pond and stated that below the lake in a ravine was “the forge”. His wife played in the forge as a child also. A man in his late 60s, the son and grandson of miners at Catoctin Furnace, said the area was known throughout the community as the “Old Forge field”. When he was young, horses were put in the field to graze. He had seen the Old Forge house in the same locale indicated by the other informants and stated that it was “a pretty good size”. The majority of Auburn pond was destroyed by the construction of US Route 15, but the stone-faced, earth embankment of the dam was still extant in 1977. The dam is marked by a right-angle formed by its embankments, the southeast of which measures about 45.72 meters (150 ft) and the southwest about 30.48 meters (100 ft). The embankment is made of earth standing some 2.1336 meters (7 ft) above base soil on the outside and faced with stone wall 1.524 meters (5 ft) high constructed of fieldstone without mortar. A prime function of the dam was to provide water to run a water wheel, the inset niche for which is seen in the southeast wall. The wheel niche measures about 4.572 meters (15 ft) at its entrance and is set back into the dam about 3.6576 (12 ft). The wheel niche, according to the folklore of the area, was an overshot wheel that powered the iron-working hammer at the conjectured forge (see above). An 1858 Map does depict an “old forge” located in the area, just below the dam. South of the dam retaining wall, two stone pillars mark the entrance to the Auburn Mansion grounds; once home to the owners of the furnace. The pillars themselves were only erected in the 1920s, but according to the locals, mark an area in which several report finding artifacts relating to the history of Catoctin over the years.

Intensive survey work, both historical/oral history research and surveying of the major historical features in the area (dam, wheel niche, etc.), revealed relatively quickly that the site was potentially one of great importance and research potential. Thus, research transitioned quickly to Phase II testing during the 1977 field season. Phase II fieldwork entailed the excavation of 3 backhoe trenches in the vicinity of the wheel niche, and 8 small hand excavated test units in the area surrounding the stone entrance posts (see above). Backhoe Trench 1 was made about 4.572 meters (15 ft) in front of the aforementioned wheel niche and ran parallel to the dam retaining wall for 4.572 meters. It was excavated to a depth of 2.4384 meters (8 ft) and revealed a red clay subsoil underlaying a thin humus layer. However, a deep pit had been cut into the red clay by non-natural means in one area and a slag fill had been deposited. Investigators had not reached the bottom of this slag layer even after excavating to the depth indicated. Backhoe Trench 2 was located directly south of Trench 1 and measured 3.048 meters (10 ft) in length and 1.524 meters (5 ft) in depth. An identical slag fill was encountered, consisting of large pieces of

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"furnace glass", typically associated with the later Catoctin furnaces such as "Isabella" and especially "Deborah". The slag may be associated with the construction of old US 15. Trench 3 located 7.62 meters (25 ft) southwest of Trench 2 measured 3.048 meters by 76.2 centimeters and was 2.54 meters (8 ft, 4 in) deep. The stratigraphy showed stratified sand layers associated with US 15 construction in the 1960s covering the slag layer and resting on the red clay subsoil. The slag layer was designated Feature 1. The hand-excavated test units were placed around the two stone entrance posts and varied in size (but were generally about 0.762 X 0.762 meters). Immediately, objects were uncovered in the test units revealing an area measuring some 24.384 meters (80 ft) north-south and 30.48 meters (100 ft) east-west with a common artifact-bearing strata. The artifact bearing strata (designated Feature 2) lay directly atop the red clay subsoil and was in turn overlain by a fill, a thick humus, and by one of several blankets of fills resulting from road construction projects in the vicinity. At the bottom of this stratigraphic feature, a charcoal zone and several layers of porous iron nuggets were encountered in several pits (usually coated with red clay and iron artifacts).

Artifacts encountered within the Feature 2 layer include 243 activity items related to iron-working, 5 architectural objects, and 21 miscellaneous items. The iron-working activity items were 18 sprues or pieces of gate metal (the iron waste from pouring molten metal into molds), 215 nuggets of porous "sponge iron" (a by-product of iron smelting often used to produce wrought iron), 6 small fragments of slag, two 1.27 cm (½ in) thick metal plates, a squared wrought iron bar with sharp tip, and a wrought iron bar bent at a right angle. The architectural objects are 2 fragments of white "furnace brick" (1 with writing), 2 badly corroded iron nails (these aren't necessarily architectural given the context), and 1 spigot of shiny metal (probably pewter). The miscellaneous items are fragments of charcoal and burnt wood. In addition to these artifacts, a red iron oxide was noted throughout much of the surrounding sand and clay feature fill.

It was clear to researchers that Feature 2 represented some kind of iron-working facility. But exactly what kind was still very much in question. The presence of sprues and gate metal suggests either a foundry or blast furnace, while wrought iron and the coating of red iron oxide are suggestive of a forge. Both foundries and forges could have been engaged in "reclaiming" iron from furnace waste like sponge iron. In addition, the location of the site a little under ¾ of a mile from the main furnace area (Isabella) suggested the possibility that the site might be the 1774 furnace discussed above. It should be noted that all three types of facilities (blast furnaces, foundries, and forges) were engaged in producing very different products despite the frequent (and erroneous) substitution of one term for another in common language. A brief description of each is warranted here for clarity's sake.

A blast furnace is primarily a facility for producing metallic iron from iron ore (hematite). Eighteenth and nineteenth century iron furnaces were pyramidal stone structures lined with firebrick to form an enclosed conical hearth. They contained an opening at the top of the pyramidal "stack" and usually two major openings near the base. The top of the stack was "charged" by dumping iron ore, charcoal, and limestone for flux in specific amounts and orders. A fire was lit at the base and the charcoal began to burn, heating up the iron ore. One of the openings near the base of the stack was used to supply air to the furnace hearth by means of water-powered bellows. This brought the temperature ever higher until the iron began to flow down to the base of the stack. The impurities tended to collect at the top of this iron "pool" and would be drained off via a "cinder hole" in the other base opening. Then the iron itself could be allowed to pour out either into sand molds for cast iron products (such as hollowware), or if it wasn't as pure it could be poured into standard size "pig iron" molds. Cast iron products would go to ancillary structures for finishing and then to the market. Pig iron would either be shipped to market or would be sent to a local foundry or finery forge. Foundries, like blast furnaces, also contained an enclosed furnace and a water-powered bellows for supplying air. In physical structure, foundries are quite similar to furnaces, but often on a smaller scale. The furnace at a foundry, however, is used principally for re-melting pig iron as well as cast iron scrap and waste. The molten iron is then poured into molds in a large sand casting floor. Again, this produces cast iron goods for the market. Both blast furnaces and foundries would require extensive foundation excavations and stones for their construction. The foundations of a furnace should be far more substantial than those of a foundry. In addition, several grades of sand would be present in archeological deposits for casting. Sprues or "gate wedges" were often produced where the iron poured through the sand runner into a mold. These were broken off and sold as scrap (but frequently would get discarded around the hearth as well). The hydraulic power system to supply energy to the bellows should also be in evidence at such sites.

Forges are very different. Forges are characterized by an open hearth and a hammer. The purpose of a forge is to refine sponge iron (which could be obtained from the furnace cinder piles) into wrought iron. Through repeated hammering and folding the slag is either beaten out or incorporated into the metal, making it more fibrous and strong. Bellows are also needed to heat the "open" hearth of a forge, and are supplied with power via a water raceway and wheel (as is the hammer itself). A finery forge was an even more specialized structure which was designed to efficiently produce wrought iron from pig iron coming out of the blast furnace. In a finery, the pig iron was remelted in a small furnace (the actual finery) to eliminate carbon and other unwanted elements. The result was a "bloom" of iron and slag which was then hammered until the iron was condensed (with small amounts of slag). The iron was then re-heated in an open hearth called a chafery and by successive trips between finery, chafery, and hammer, the "finer" was able to produce wrought iron bars. The architectural remains from a forge could be quite variable as there were several different designs and types of forges, but evidence for a hammer, bellows, and the water power to drive both should be present at such a site. In addition, tiny sparks of hot iron and slag were driven off as the metal was hammered. This results is a thin deposit of iron oxide or "hammerscale" throughout the floor of a forge site. As the buried deposit at 18FR320 produced cast iron waste materials, casting sand, iron ore, and what appeared to be hammerscale, additional excavation work was warranted to determine exactly what type of iron-working activity took place at the site. Phase III data recovery was undertaken in both 1979 and 1981 in order to mitigate the expected adverse effects of the highway project.

During the 1979 field season a series of nine long, narrow trenches were excavated mechanically to reveal feature and stratigraphic relationships from one part of the site to another. Nine backhoe trenches were excavated there to locate and explore architectural remains. In addition, a site grid was established and 31 square 1.524 meter (5 ft) units were excavated, primarily in the area surrounding the two stone pillars. These were designed to allow careful examination of individual features and strata and to facilitate a more controlled recovery of associated artifacts. A backhoe was used to remove the top 61 cm (2 ft) of fill to reveal features and then they were excavated by hand. Soils were screened through hardware mesh only when deemed necessary for the recovery of small artifacts. Major discoveries included a rectangular building foundation with a yellowish sandy floor (Feature 1), a rather substantial stone wall (Feature 4), smaller stone walls (Feature 6), and numerous deposits of slag and charcoal containing cast iron artifacts and waste materials. A raceway (which would be expected if the site were any of the aforementioned structural types) was not encountered, but excavation just to the north (18FR331) did detect a raceway heading in that general direction. Thus, a major goal of 1the 1981 excavations was to locate a raceway on-site and obtain additional information relating to the discovered features. The excavation grid established in 1979 was also employed in 1981 and new units were tied to it. While the 1979 mechanically excavated trenches were not oriented to the site grid (but were eventually tied to it), all of the trenches excavated mechanically in 1981 were oriented to it, with one exception. A decision was made to orient a single trench perpendicular to the face of the Auburn dam in order to reveal a more representative cross section of this feature. Based on the 1979 excavations, it was believed that most of the site's data were to be obtained through examination of its features, supplemented by artifactual data. Accordingly, recovery techniques were chosen with an emphasis toward the horizontal exposure of features with less emphasis on the recovery of every artifact. The bulk of the excavation was carried out with pick and shovel, trowels being utilized only when necessary. Again, excavated soils were passed through hardware cloth only when necessary for the recovery of small artifacts. Only 3 long, narrow, mechanical trenches were excavated, but 30 large block units provided good horizontal exposure. The square test units were typically 3.048 meters (10 ft) on

a side (although some were smaller as they overlapped with previously excavated units or for other reasons.

Ignoring historically late features (such as the Auburn Mansion driveway additions and later road fills), Site 18FR320 ultimately revealed the following significant features. An early raceway was encountered during excavations in 1981. This passed through the south part of the site, providing power to some installation located to the east of the site at a time when nothing else is located at 18FR320. This was part of Catoctin Furnace's Hydraulic System A, which dates to the earliest period of industrial improvement at Catoctin Furnace (roughly 1760-1787). The raceway arrived in the site area near its northeast edge and continued due south, roughly parallel to the highway. Near the south end of the site it makes an abrupt turn east, falling rapidly in elevation. This rapid west to east fall would have supplied significant "drop" to power waterwheels for various purposes. The Auburn ore bank is located just to the west of the point where the race made its turn, which is also suggestive. For additional details regarding the hydraulic system at Catoctin (including System A) see the synopsis report for 18FR331. Several stratigraphic layers (reddish-brown silty clay and slag and charcoal layers) we encountered, which included evidence for iron-working activities. Materials in these layers were significant amounts of refining slag and charcoal, together with casting debris, fragments of cast iron artifacts, implements to finish the artifacts, and possible blacksmithing tools, all laid down at a time after the silting over of the nearby raceway. Evidence of two structures, one of which certainly post-dates the layers described above, was encountered. Perhaps of greatest importance; neither structure (despite evidence for both refining and casting of iron) can be interpreted as a forge, foundry, or blast furnace. The "hammerscale" turned out to be a different kind of iron oxide deposit and no evidence of a hammer emplacement was encountered. Also, no substantial heaps of ore, flux, or smelting slag were found at 18FR320. No burned or unburned molding sand was found (the sand that was found was not the very thick deposit expected in a casting house). Some small pieces of firebrick were encountered, but were interpreted as anomalous. In sum, it is clear that the primary activities of casting and refining were not taking place within the confines of the excavation. The stone and earth dam to the north (Auburn) cannot be dated with certainty in relation to the rest of the site, but it must post-date at least one phase or lens of the slag and charcoal layers and probably post dates the abandonment of the structures. Interpretations of these features are provided below.

Few details are provided in the full site report regarding the exact quantities and types of artifacts encountered at 18FR320. As stated previously, research was geared primarily towards the uncovering of features as these were deemed the most useful for interpretive purposes in this type of salvage archeology situation. A total of 7,809 artifacts were recovered from 18FR320; most reflecting the industrial function of the site. Ironworking activities were primarily identified through the classification of tools, fragments of manufactured items, and slag. A large portion of the assemblage consisted of cast and wrought iron objects. Few non-industrial objects were recovered. Archaeological evidence supports historical documentation that indicated that bombshells, pots, kettles, salt pans, iron stoves, and dutch ovens were produced at Catoctin. A large percentage of the artifacts from the site were flat, featureless cast iron pieces, probably from plain stove plates. Two stove door latches, two stove feet, and a stove door frame were also recovered. The only decorated stove parts were ornamented along an edge to mask a joint. Fragments of various-sized cooking pots and kettles were also recovered, including an almost complete cast iron pot. The types of tools and machinery hardware identified at the site indicated the iron working activities at Catoctin Furnace, and suggested the presence of a blacksmith. A variety of wrought tools, including 11 cold chisels, 6 files, 3 wrenches, 2 mold maker's slicks, a hammer and a draw knife, were used on site to trim and finish iron castings. In addition, cast iron flask clamps, gaggers, runners, sprues (24), and wedge-shaped iron gates (49) provide evidence of iron casting processes. The presence of horseshoes, ox shoes, and wagon parts (wrought iron goods) confirm the use of draft animals to transfer ore and fuel to the furnace and to transport goods to various markets. Evidence of non-industrial activities at the site probably relate to the individuals who worked there. The 565 ceramic sherds include coarse earthenwares, transfer-printed and annular whitewares, green-edged and blue-edged pearlwares, American stonewares, and hand-painted Chinese export porcelains. The bulk of glass bottles are colorless, with a few fragments of dark blue and green wine/beer bottles. Window glass was also encountered, concentrated around the northeast and southeast walls of Feature 1 (the rectangular building w/ sandy floor). In addition, a copper alloy powder flask with an embossed shell motif was recovered. Given the low level of details provided in the full site report for these artifacts, all objects are categorized in the table above as "activity items" (due to their probable function in iron-working activities), with the exception of the 565 sherds and 1 arms-related object (the powder flask). No quantification is available for glass goods so these are included in the total count of activity items.

Eight pieces of slag and 10 items of cast iron were submitted to laboratories for analytical tests. Quantitative elemental analysis of the major constituents of the slag was obtained from proton-induced x-ray emission spectroscopy (PIXE), and a brief metallographic examination was conducted. The ten cast iron objects (a sprue, a tripod kettle leg, a handle ear, a section of flat plate, a runner, 3 wedge gates, a gutter or possibly a section of pig, and a fragment of pig iron) were subjected to the same analyses and also subjected to scanning electron microscopy. Analysis of the slag revealed that green glass slag recovered at the site was clearly the result of primary smelting processes in a charcoal-fueled blast furnace; i.e. not the later coke-fueled furnace "Deborah" which would have introduced a higher sulfur content into the slag. Ferrous slag (the spongy iron cinders/nuggets) were provisionally identified as deriving from the refining of pig or cast iron in a finery and chafery forge (see above). Slight differences in the structure of these slags can be explained by differing cooling rates. One slag sample is anomalous and was interpreted as furnace or hearth rake-out. Analysis of the ten cast iron objects reveals one over-riding result; the objects had a very high phosphorous content. This reveals, what much of the historic record suggests; that the Catoctin iron industry was known for producing fine cast iron objects, but was not known for producing suitable wrought iron. Phosphorous was undesirable in wrought iron, but since it would increase fluidity and melting range of the cast irons, it would generally have given them good castability.

This evidence, coupled with the excavation work begins to start shaping a picture of the iron-working activities taking place at the site. The major revelation was that, while the refining of iron and perhaps the casting of iron were taking place near Site 18FR320, it was at a locus well outside the area of impact of the US 15 realignment study and probably, as indicated by historical and archival research, beneath the road fill of MD Route 806 to the east. A raceway (designated Feature 44) dates to an early stage at the site and directed water in this general direction with significant "drop", probably a "head race" to power some as yet unidentified structure to the east. There was no refining slag within the race fill, but there were small nodules of furnace glass (smelting slag) from a charcoal-fueled blast furnace. The aforementioned gunpowder flask was also found within the fill and is thought to date between 1800 and 1825. It is postulated that this race was supplying water power for the first furnace at Catoctin built by the Johnsons around 1774. According to Alexander's letter it was out of blast around 1787, the date when another charcoal stack was built ¾ of a mile to the north in what would become the main furnace area at Catoctin. Major alterations were made to the raceway design when Hydraulic System B was constructed (see synopsis report for 18FR331). These would have accelerated the silting over of the old raceway through the site, which seems to have occurred between 1787 and the early 1830s. Aside from the raceway, the crucial period for the site's use and the spike of activity seen in the charcoal, slag and other layers equates most probably with the 20 year span between 1830 and 1850. One structure dating to that period is probably a charcoal house. The construction of Feature 4 (one of the two structures identified), oral traditions, and the layers within and around it are all in keeping with an identification of it as a charcoal house. No definitive interpretation can be offered for the other structure (Feature 1). While casting debris, sand, and fragments of cast iron artifacts were encountered, there is no evidence of a furnace foundation for either a blast furnace or foundry and the sand layers are not thick enough to have served as a casting floor. The presence of certain tools and a lack of diagnostic objects (suggesting the floor of the structure was kept very clean) indicate that the building may have been an ancillary iron-working structure used as a workspace for the "finishing" of cast iron wares.

Phase II and Phase III Archeological Database and Inventory

Site Number: 18FR320 **Site Name:** Catoctin Foundry

Other name(s) Orr's "Check 3"

Prehistoric ☐ Historic ☑ Unknown ☐

Brief Description: late 18th century mill race, early-mid-19th century iron foundry/forge

No direct evidence of the “forge” that historical evidence points to in this area was encountered. A few fragments of firebrick were recovered and the race certainly must have provided power to “something”, but the only solid evidence for a forge comes from historical records (most notably a mid 19th century map and oral histories). The analysis of slags from the site also presents a problem. Several of the spongy iron slag samples were identified as coming from a finery forge. At the same time, metal analysis and the historical record indicate that Catoctin did not produce good ores for the production of wrought iron. The locale could have supported a foundry. Runners, gate metal, etc. would normally be knocked off of the finished iron piece at a location not far removed from the furnace or foundry (and casting floors). A finery forge and foundry must have been situated east of the site in the direction supplied by the raceway. This was the ultimate conclusion reached by the site investigators. They suggested that the conjectured forge might have been an experimental, short-lived attempt by the furnace owners to produce wrought iron. The aforementioned 1858 Map reference to an “old forge” in the vicinity would seem to suggest that by that time the endeavor was already defunct and had been for some time. A foundry may have been set up in its place, or the two conjectured structures could have been part of a combined complex. The main hitch in any of these ideas is that the most likely period for the use of such structures is the very era during which the raceway is silting up (1787-ca. 1831). Better dating of the dam’s construction and the structures of Hydraulic System B and C would definitely aide in interpretation.

While the site itself has largely been exhausted of its research potential, areas directly to the east of the site warrant further examination. Much of this area has been altered by road construction. However, much of the alteration was likely the addition of historic fills that may have buried and sealed the site. Testing should be undertaken if an opportunity presents itself to determine if A) evidence of the early (1774) furnace can be obtained and B) if the conjectured early-mid 19th century finery forge, foundry, or combined forge and foundry are located in this area to the east of 18FR320.

External Reference Codes (Library ID Numbers):

00005963, 00005972, 00005973, 00005976